

CLAIMS

1. A pipe coupling comprising:

a socket and a plug that have an appropriate lock mechanism and are detachably connected to each other;

5 said socket having a socket fluid passage that is opened or closed with a ball valve incorporated therein, said socket fluid passage having a primary fluid passage portion through which a fluid is supplied into said socket, said primary fluid passage portion being provided therein
10 with a cylindrical seal member in pressure contact with said ball valve to seal between said ball valve and an inner wall of said socket fluid passage, and said ball valve being rotatable to open when said socket and said plug are locked to each other by said lock mechanism;

15 wherein said ball valve is provided with a sub-valve bore that allows the fluid in the primary fluid passage portion of said socket fluid passage to be delivered to a secondary fluid passage portion of said socket fluid passage through said ball valve before a valve bore of said
20 ball valve opens into said socket fluid passage when said ball valve is rotated.

2. A pipe coupling according to claim 1, wherein the secondary fluid passage portion of said socket fluid passage is provided with a movable valve that retracts to
25 open said secondary fluid passage portion when it is pushed by a distal end of said plug as inserted into said socket, and when said plug is removed from said socket, said movable valve advances to close said secondary fluid

passage portion;

said ball valve having a ball rotating shaft to rotate it, said ball rotating shaft being formed with a purge passage having a purge inlet that opens into a
5 secondary space formed in said secondary fluid passage portion between said ball valve and said movable valve, said purge passage further having a purge outlet that opens outside said socket fluid passage, said purge outlet being capable of assuming either of two positions, i.e. one where
10 said purge outlet communicates with a fluid recovery passage provided in said socket, and another where it does not, according to a difference in rotation angle of said ball rotating shaft, wherein when the rotation angle of said ball rotating shaft coincides with an angle at which
15 the valve bore of said ball valve is open into said socket fluid passage, the purge outlet is not in communication with the fluid recovery passage, whereas when the rotation angle of said ball rotating shaft is such that the valve bore of the ball valve is not open into said socket fluid
20 passage, the purge outlet is in communication with the fluid recovery passage.

3. A pipe coupling according to claim 2, wherein a cylindrical seal member is disposed at a communicating opening of the fluid recovery passage that is communicable
25 with the purge outlet of the purge passage formed in said ball rotating shaft, said cylindrical seal member being in pressure contact with said ball rotating shaft to seal between said ball rotating shaft and an inner wall of the

fluid recovery passage when the purge outlet and the fluid recovery passage are not in communication with each other, and wherein a pressure balancing member is disposed at a side of said ball rotating shaft opposite to a position at
5 which said cylindrical seal member disposed in said fluid recovery passage is in pressure contact with said ball rotating shaft, said pressure balancing member being adapted to apply a contact pressure to said ball rotating shaft that balances a contact pressure applied by said
10 cylindrical seal member.

4. A pipe coupling according to claim 2 or 3, wherein said lock mechanism of said socket and plug comprises:

a locking sleeve fitted on an outer periphery of a distal end portion of a socket body, said locking sleeve
15 being arranged such that when advanced, the locking sleeve presses lock members in a centripetal direction, whereas when retracted, the locking sleeve releases the lock members from its pressing action; and

an engaging groove formed on an outer periphery of
20 said plug, said engaging groove being engageable with said lock members;

said ball rotating shaft being provided with a handle for rotating it outside the socket body and further provided with a cam rotating together with the ball
25 rotating shaft as one unit, said cam having a first control portion and a second control portion;

wherein said locking sleeve is provided with an abutment arranged such that when the locking sleeve is in

its retracted position, the abutment is positioned in close proximity to the second control portion of said cam, so that if the cam is attempted to be rotated, the abutment abuts on the second control portion to prevent rotation of the cam, thereby preventing the ball valve from being opened, whereas when the locking sleeve is in its advanced position, the abutment is away from the cam to allow rotation of the cam, and if the locking sleeve is attempted to be retracted when it is in its advanced position and the ball valve is open, the abutment abuts on the first control portion of the cam to prevent retraction of the locking sleeve that is in its advanced position.

5. A pipe coupling according to claim 4, wherein said cam is in a shape of a partially cut disk, wherein a circular arc-shaped outer peripheral edge of the cam is defined as said first control portion, and a cut portion of the cam is defined as said second control portion.